

Outside Container Storage Area Source Material Mass Reduction Work Plan

Remedial Design

Southeast Rockford Groundwater Contamination
Superfund Site

Area 9/10, Rockford, IL

CERCLIS ID No. IL9801000417

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SECTION 1.0

INTRODUCTION

This Outside Container Storage Area (OSA) Source Material Mass Reduction Work Plan (SMMRWP) presents the rationale, procedures, and methods to address in part the Southeast Rockford Source Control Operable Unit identified as Area 9/10W in the Area 9/10 portion of the Southeast Rockford Groundwater Contamination Superfund Site (SER site) located in the City of Rockford, Illinois (Figure 1.1). The term "Site" refers to Area 9/10, an industrial area in Rockford, Winnebago County, Illinois, that is bounded by Eleventh Street on the east, Twenty-third Avenue on the north, Harrison Avenue on the south, and Sixth Street on the west. The OSA was operated as a RCRA hazardous waste storage facility by the Hamilton Sundstrand Corporation (HS) Plant #1 facility which is located within Area 9/10 at 2421 Eleventh Street. Figure 1.2 depicts a site map of the HS facility. This SMMRWP provides a detailed description of activities to be implemented in the OSA area. The OSA site features are shown on Figure 1.3.

HS is working with the United States Environmental Protection Agency (USEPA) and the Illinois Environmental Protection Agency (IEPA) in accordance with the Administrative Order on Consent (AOC) for Remedial Design for Area 9/10 signed on January 13, 2003 and the Record of Decision (ROD) relating to source control for the SER site which was signed on June 11, 2002. As part of the remedial design process, some pre-design investigation has been conducted in the vicinity of and on the HS property including the OSA. A pilot test of the selected ROD technologies, soil vapor extraction and air sparging, was also conducted at the OSA.

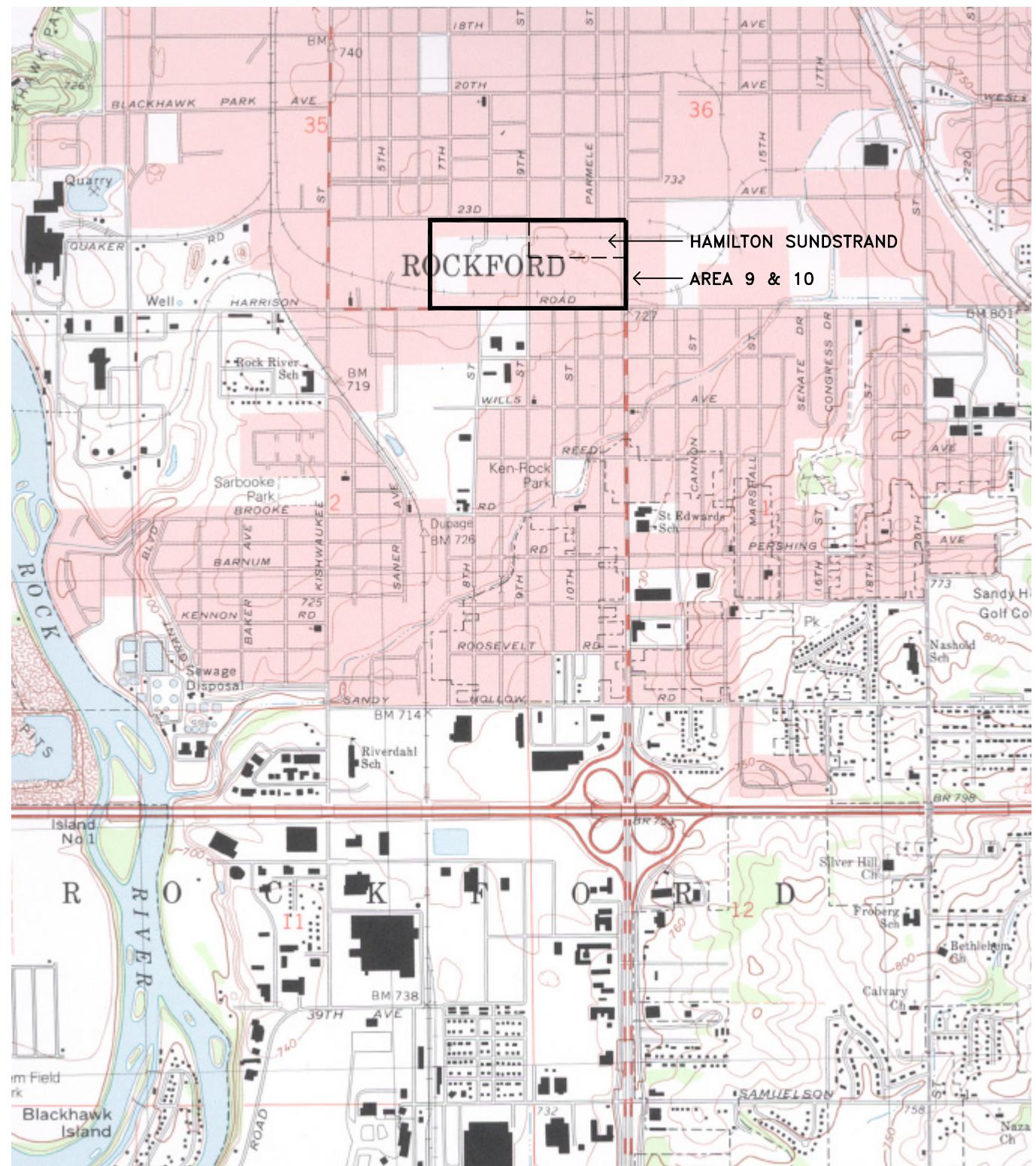
The investigation and pilot study results indicated that the majority of source material with the future potential to impact groundwater within the OSA is located in the near surface soils.

This proposed effort has been identified as an opportunity to provide practical support for the overall action to be taken in Area 9/10 and the overall SER site to address source control with respect to the Operable Unit Three ROD with a specific focus on the OSA.

SOURCE MATERIAL MASS REDUCTION OBJECTIVES

The objective of this work plan is to address a substantive portion of the source material identified at the OSA. The implementation of the activities outlined in this plan will help meet the goals the ROD established for Area 9/10. This will be accomplished by the following:

- Contaminant mass removal by excavation and off-Site disposal of source material;
- Enhancement of natural attenuation ongoing at the Site; and
- Limiting water infiltration by construction of a clay cap over the OSA.



REFERENCE: USGS 7.5 MINUTE QUADRANGLE: ROCKFORD SOUTH, IL

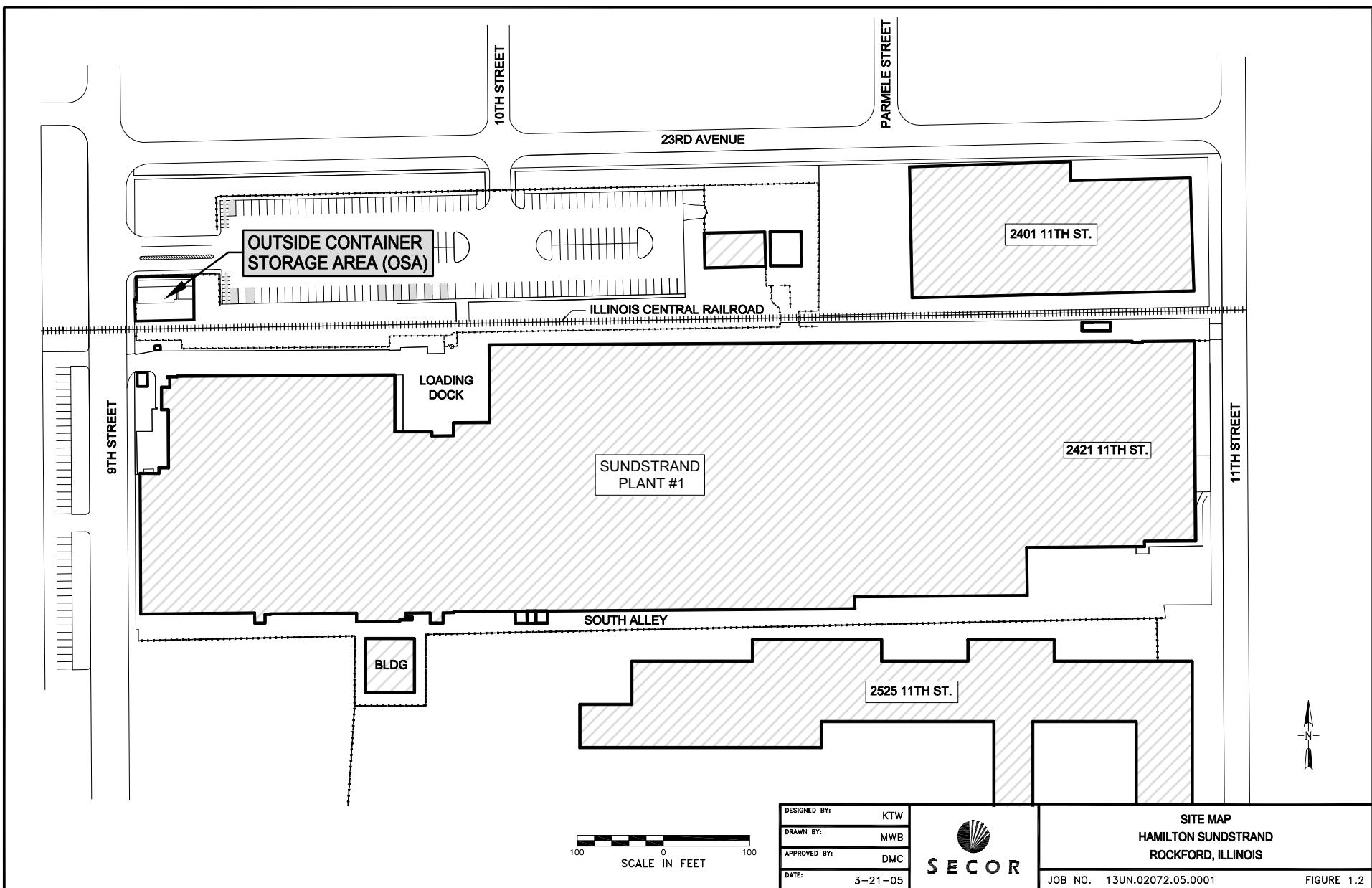
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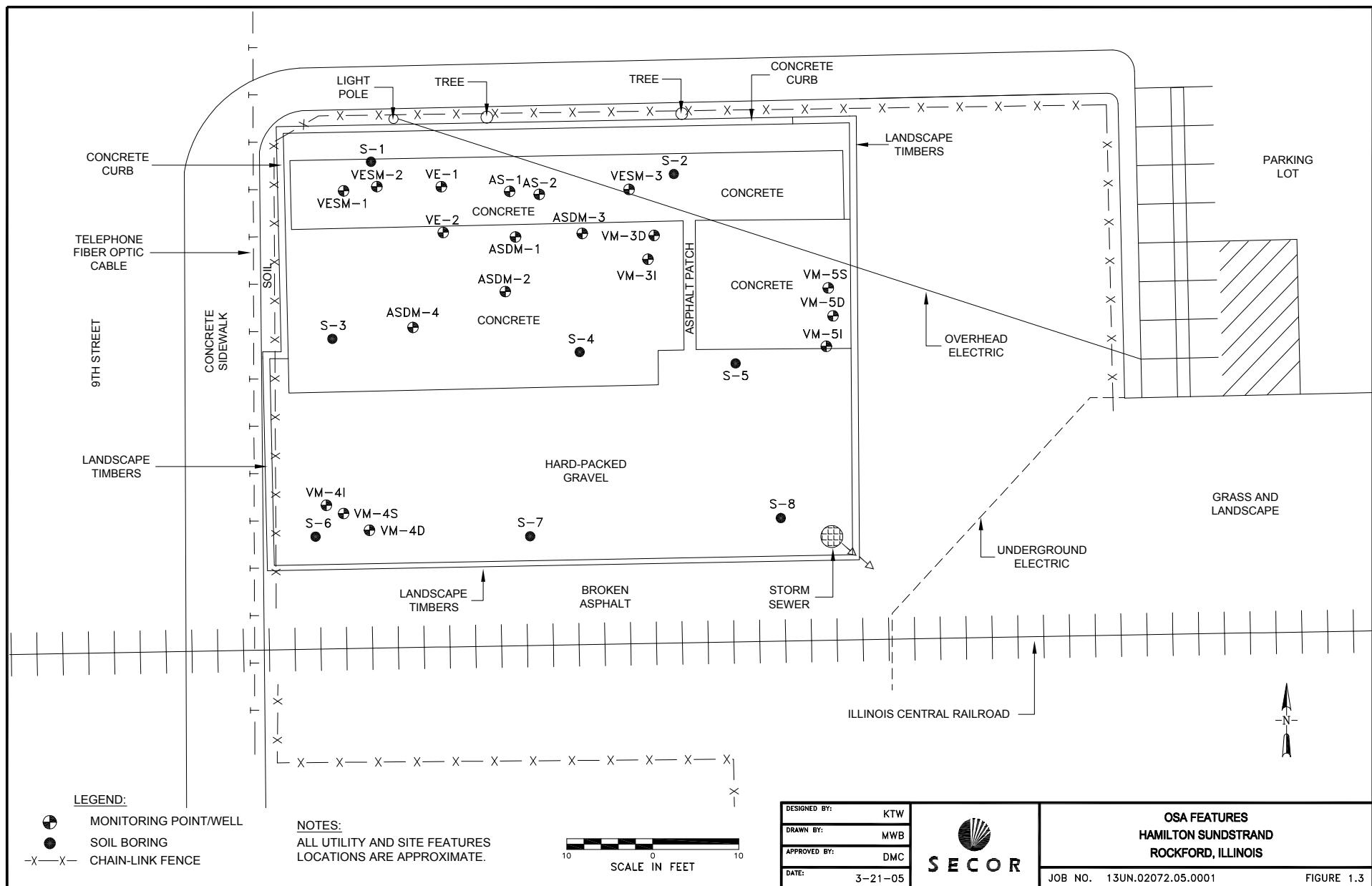


SITE LOCATION MAP
HAMILTON SUNDSTRAND
AREA 9/10
ROCKFORD, ILLINOIS

JOB NO. 13UN.02072.05.0001

FIGURE 1.1





OSA SOURCE MATERIAL EXCAVATION RATIONALE

There are several contributing factors in the decision to excavate the impacted soils in this area and dispose of them offsite. Excavation offers immediate, quantifiable, and unequivocal results. Other factors include:

- Tetrachloroethene present at concentrations above the soil saturation limit (C_{sat}) in shallow soils would be difficult and impractical to remediate using soil vapor extraction (SVE);
- Silty clay from the ground surface to a depth of approximately six feet will severely restrict airflow in the most impacted shallow soil zone;
- SVE for near surface soil remediation typically is susceptible to short circuiting of airflow from above ground and elicits a small radius of influence (ROI); and,
- Metals above ROs were detected in samples collected in the OSA that would not be addressed by other methods evaluated and identified in the ROD such as SVE;

The SVE Pilot Test performed in November 2003, and reported in the Pilot Test Summary Report dated October 2004, confirmed these technical challenges and limitations at the OSA with respect to shallow (near surface) soil impacts.

DESCRIPTION AND USE OF THE OSA

The OSA consists of a concrete pad approximately 30 feet wide by 65 long and a gravel area immediately south of the pad. The entire area of the OSA is 50 wide by 65 feet long. The OSA was used historically for the storage of a variety of waste materials including wastes stored in drums and bins of metal chips which contained non-hazardous coolants and cutting oils. The OSA is located in the northwest portion of the HS facility adjacent to the public right of way (concrete sidewalk) east of 9th Street. The area is surrounded by a chain link security fence.

HISTORICAL ACTIVITIES AT THE OSA

Historically, the pad had been constructed with a collection trench and underground drain line that connected to an underground storage tank (Tank #24). The underground drain line was removed in 1990 and the tank was removed in 1992. Minor portions of the concrete pad were removed to facilitate these activities. The concrete pad was sloped northward so that any liquids would drain into the collection trench. The collection trench was reportedly three feet wide, 60 feet long and eight inches deep. The collection trench, and OSA in general, was filled with pea gravel after being taken out of service for aesthetic purposes. When the OSA was in operation, the concrete pad area was covered by a metal corrugated roof supported by steel trusses and columns. This overhead structure has since been removed.

SITE GEOLOGY

The OSA concrete pad and gravel area surface cover are underlain by silty clay to a depth of approximately six feet. The clay overlies a poorly graded medium sand with occasional gravel layers and extends to a depth of greater than 140 feet. A thin, 1.5 – 4.0 feet thick silt layer, beginning at a depth of about 19 feet bgs, has been identified in this area. This silt layer is laterally discontinuous and is not present at boring locations to the south and east of the OSA. The water table is approximately 32 feet below ground surface (bgs).

CONSTITUENTS OF CONCERN

Based on the Remedial Investigation results and the ROD, the constituents of concern (COCs) for Area 9/10 consist of volatile organic compounds (VOCs) and petroleum hydrocarbons associated with jet fuel. Previous sampling at the OSA also identified metals above the 35 IAC Part 742 Tiered Approach to Corrective Action Objectives (TACO) residential and commercial/industrial remediation objectives (ROs).

SECTION 2.0

OSA INVESTIGATION AND DATA EVALUATION

As part of the Area 9/10 remedial design activities, additional investigation was performed at the OSA to better understand the target constituent concentrations and their distribution within the soil matrix. Also, air sparge and SVE infrastructure was installed and pilot tested to identify the technical requirements and challenges to address the COCs.

2003 PRE-DESIGN INVESTIGATION AND PILOT STUDIES

In October 2003, a subsurface investigation was conducted at the OSA to provide a current condition assessment of constituents in soil. This investigation consisted of eight soil borings (S-1 through S-8) at the locations shown on Figure 1.3. Each of these borings extended to near the groundwater table at 30 to 32 feet bgs. Soil samples were collected in accordance with the approved Field Sampling Plan, dated March 31, 2003, and submitted to STL Laboratory in University Park, Illinois. Samples were analyzed for VOCs by Method 8260B; TCLP metals by SW-846 Methods 1311/6010B/7040A/7470A; and total petroleum hydrocarbons (TPH) consisting of diesel range organics (DRO) by Method 8015B MDRO. A summary of the analytical results is presented in Appendix A. These summary tables were also provided in the Pre-Design Investigation Preliminary Results Summary Presentation Materials dated August 10, 2004.

SVE and air sparge pilot testing was conducted in Fall 2003 using new and existing wells. In total, there are 17 extraction wells and monitoring points in the vadose zone and two air sparge wells screened within the saturated zone. The locations of these wells are shown on Figure 1.3. The test results and a compilation of all information collected were summarized in the Pilot Test Summary Report dated October 1, 2004. The pilot testing confirmed that significant air flow can be induced in this area under relatively low applied vacuums in the vadose zone; however, limited airflow was observed in the shallow soils where the majority of the contaminant mass was identified. These technologies also do not address metals contamination.

SOIL ANALYTICAL RESULTS EXCEEDING ROs

The soil analytical results were compared to the TACO Tier 1 residential and industrial/commercial ROs. The following constituents exceeded the soil component of the groundwater ingestion pathway: cadmium, lead, 1,1-dichloroethene (1,1 DCE), 1,2-dichloroethene (1,2 DCE), 1,1,1-trichloroethane (1,1,1 TCA), 1,1,2-trichloroethane (1,1,2 TCA), trichloroethene (TCE), and tetrachloroethene (PCE) in one or more OSA soil sample intervals. TCE and PCE also exceeded the inhalation pathway ROs and PCE exceeded the ingestion RO.

AVERAGED SOIL RESULTS AND MASS ESTIMATION

In accordance with 35 IAC Part 742.225(c) continuous interval soil sample results were averaged at each boring location. The averaged soil results indicated there are COCs above ROs. If constituents were below the method detection limit, one-half of the reporting limit was used as the value for averaging purposes. As a simplifying assumption, all of the samples from each boring were used to determine average concentrations, regardless of the number of times the COC was detected. A summary of the COCs is provided in Table 2.1. The COCs which exceeded the ROs after averaging of the samples were cadmium, lead, 1,1 DCE, 1,2 DCE, 1,1,1 TCA, 1,1,2 TCA, TCE and PCE.

TABLE 2.1
OSA SOIL ANALYTICAL RESULTS AVERAGED BY BORING
AREA 9/10

SECOR

SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

Boring Number	Constituents Exceeding ROs	TACO Soil Remediation Objectives (ROs)	Constituent Maximum Concentration	Constituent Average Concentration Entire Boring
S-1	1,1-Dichloroethene	0.06 0.4 0.06 2 0.06 0.0075	0.560	0.057
	1,2-Dichloroethene (total)		12.000	1.462
	Tetrachloroethene		360.000	34.206
	1,1,1-Trichloroethane		220.000	24.090
	Trichloroethene		18.000	1.877
	Lead		0.009	0.004
S-2	1,1-Dichloroethene	0.06 0.4 0.06 2 0.06 0.005	1.300	0.098
	1,2-Dichloroethene (total)		7.200	0.542
	Tetrachloroethene		320.000	21.661
	1,1,1-Trichloroethane		240.000	16.100
	Trichloroethene		20.000	1.358
	Cadmium		0.012	0.003
S-3	1,2-Dichloroethene (total)	0.4 0.06 2 0.06 0.005	0.750	0.063
	Tetrachloroethene		20.000	1.339
	1,1,1-Trichloroethane		4.800	0.366
	Trichloroethene		0.450	0.036
	Cadmium		0.010	0.003
S-4	1,2-Dichloroethene (total)	0.4 0.06 0.06 0.005	0.450	0.112
	Tetrachloroethene		5.100	0.939
	Trichloroethene		0.310	0.066
	Cadmium		0.160	0.022
S-5	Tetrachloroethene	0.06 0.06 0.005 0.0075	8.100	1.165
	Trichloroethene		0.190	0.031
	Cadmium		3.900	0.340
	Lead		0.043	0.008
S-6	Tetrachloroethene	0.06 0.005 0.0075	0.140	0.034
	Cadmium		0.008	0.003
	Lead		0.110	0.010
S-7	Tetrachloroethene	0.06 2 0.06 0.0075	49.000	3.299
	1,1,1-Trichloroethane		12.000	0.891
	Trichloroethene		0.670	0.048
	Lead		0.028	0.005
S-8	Tetrachloroethene	0.06 0.02 0.06 0.005	2.800	0.240
	1,1,2-Trichloroethane		0.500	0.036
	Trichloroethene		0.110	0.011
	Cadmium		0.047	0.007

Notes:

VOC analysis by Method 8260B results are presented in mg/kg.

Metals results are from a TCLP extract and are presented in mg/l.

1) Tier I Residential Soil Migration to Class I Groundwater; Tiered Approach to Corrective Action Objectives.

2) Average concentrations based on 1/2 the Reporting limit for constituents that were not detected.

3) Constituent Concentrations in Soil Meet TACO Tier I ROs.

4) Constituent Concentrations in Soil Exceed TACO Tier I ROs.

5) 1,2 DCE (Total) ROs based on cis-1,2 DCE (more conservative than trans-1,2 DCE).

6) Due to averaging of results all concentrations are presented to the nearest 0.001

7) Soil Averaging based data from the interval of 0-32 feet

The continuous depth interval sampling was used to identify the depth of potential source material at each boring. To facilitate this effort, the OSA area was divided into eight subareas, their boundaries being half way between the boring locations. The analytical data from each boring was considered representative of that subarea. This approach was used to develop a general estimate of the overall contaminant mass in place and determine what mass may potentially remain after the excavation and removal of impacted soil at each subarea in two feet lifts.

OSA EXCAVATION SUBAREAS AND TARGET DEPTHS

The removal of impacted soil to a minimum target depth of four feet is planned. The target depth for excavation of each subarea is shown on Figure 2.1. The actual depth of soil to be removed in each subarea will be based on health and safety considerations and preservation of the structural integrity of existing infrastructure including utilities onsite and adjacent to the OSA. A comparison of the post excavation average soil concentrations and ROs is provided in Table 2.2.

MASS OF POST EXCAVATION SOURCE MATERIAL REMOVED BY EXCAVATION

Upon completion of the excavation activities, assuming the target excavation depths are attained, the majority of soil containing elevated cadmium, lead, 1,1 DCE, 1,2 DCE, 1,1,1 TCA, 1,1,2 TCA, TCE, and PCE will have been removed, based on the current (S-1 through S-8) soil boring data. After the completion of this source removal effort it appears PCE will be the only VOC which will exceed the ROs. A comparison of the estimated mass of PCE currently in place and an estimate to remain after excavation is provided in Table 2.3. The estimate of PCE removal is believed to be greater than 95% of the initial mass.

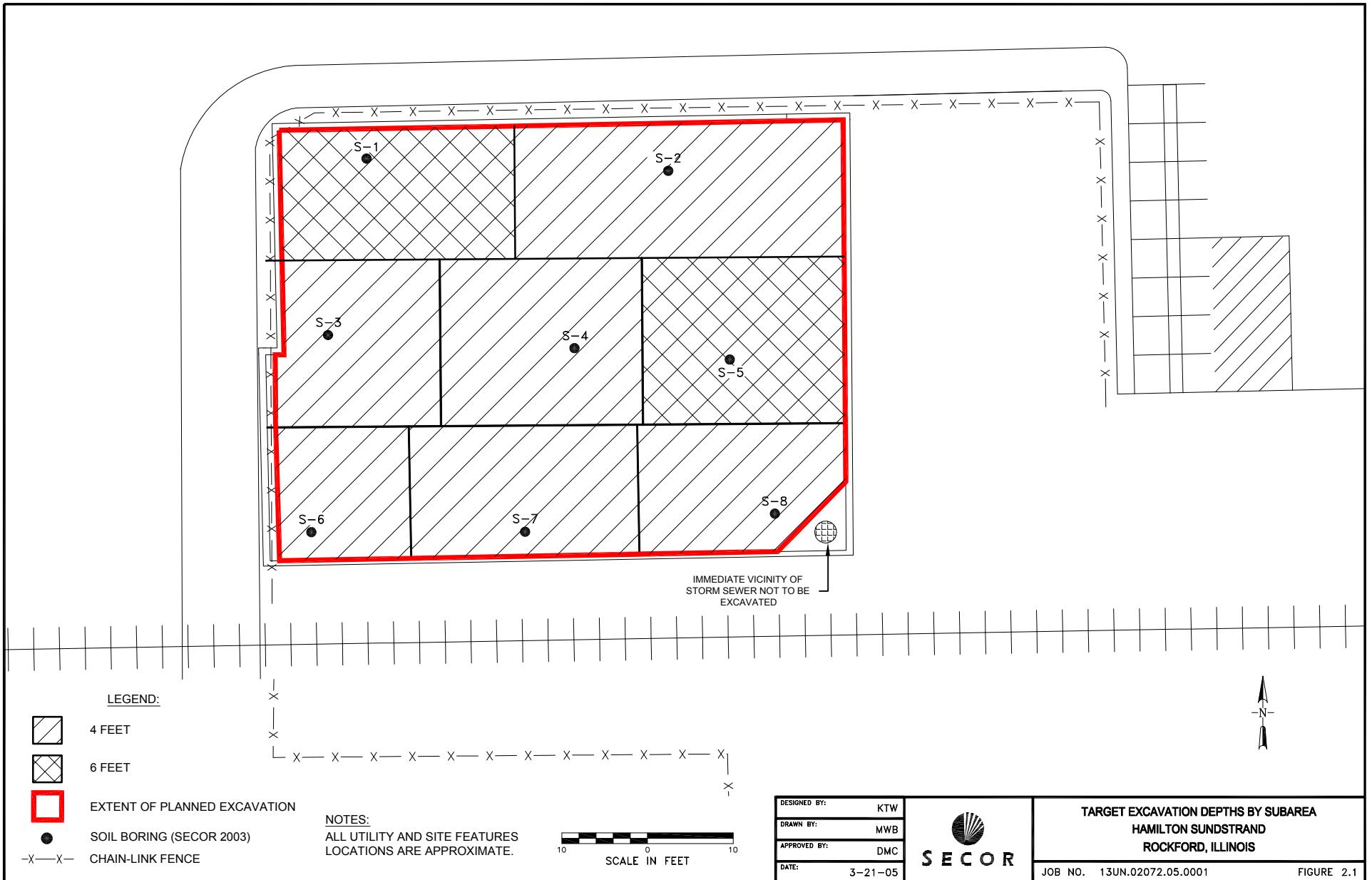


TABLE 2.2
OSA POST EXCAVATION AVERAGE SOIL CONCENTRATIONS
AREA 9/10

SECOR

SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

Boring Number	Constituents Exceeding ROs	TACO Soil Remediation Objectives (ROs)	Constituent Average Concentration w/ Excavation of 2 Feet	Constituent Average Concentration w/ Excavation of 4 Feet	Constituent Average Concentration w/ Excavation of 6 Feet
S-1	1,1-Dichloroethene	0.06	0.057	0.046	0.006
	1,2-Dichloroethene (total)	0.4	1.462	0.709	0.041
	Tetrachloroethene	0.06	34.206	10.935	0.238
	1,1,1-Trichloroethane	2	24.090	10.096	0.104
	Trichloroethene	0.06	1.877	0.725	0.012
	Lead	0.0075	0.004	0.004	0.004
S-2	1,1-Dichloroethene	0.06	0.098	0.012	0.009
	1,2-Dichloroethene (total)	0.4	0.542	0.067	0.051
	Tetrachloroethene	0.06	21.661	0.351	0.293
	1,1,1-Trichloroethane	2	16.100	0.107	0.087
	Trichloroethene	0.06	1.358	0.026	0.019
	Cadmium	0.005	0.003	0.003	0.003
S-3	1,2-Dichloroethene (total)	0.4	0.064	0.016	0.014
	Tetrachloroethene	0.06	1.426	0.099	0.107
	1,1,1-Trichloroethane	2	0.388	0.073	0.066
	Trichloroethene	0.06	0.036	0.006	0.006
	Cadmium	0.005	0.003	0.003	0.003
S-4	1,2-Dichloroethene (total)	0.4	0.098	0.069	0.069
	Tetrachloroethene	0.06	0.619	0.304	0.304
	Trichloroethene	0.06	0.049	0.029	0.021
	Cadmium	0.005	0.024	0.025	0.027
S-5	Tetrachloroethene	0.06	1.165	1.127	0.591
	Trichloroethene	0.06	0.031	0.030	0.017
	Cadmium	0.005	0.340	0.086	0.092
	Lead	0.0075	0.008	0.009	0.008
S-6	Tetrachloroethene	0.06	0.033	0.026	0.021
	Cadmium	0.005	0.003	0.003	0.003
	Lead	0.0075	0.011	0.004	0.004
S-7	Tetrachloroethene	0.06	3.299	0.035	0.031
	1,1,1-Trichloroethane	2	0.891	0.037	0.029
	Trichloroethene	0.06	0.048	0.004	0.004
	Lead	0.0075	0.005	0.004	0.004
S-8	Tetrachloroethene	0.06	0.240	0.057	0.050
	1,1,2-Trichloroethane	0.02	0.036	0.002	0.002
	Trichloroethene	0.06	0.011	0.004	0.003
	Cadmium	0.005	0.007	0.007	0.006

Notes:

VOC analysis by Method 8260B results are presented in mg/kg.

Metals results are from a TCLP extract and are presented in mg/l.

1) Tier I Residential Soil Migration to Class I Groundwater; Tiered Approach to Corrective Action Objectives.

2) Average concentrations based on 1/2 the Reporting limit for constituents that were not detected.

3) Constituent Concentrations in Soil Meet TACO Tier I ROs.

4) Constituent Concentrations in Soil Exceed TACO Tier I ROs.

5) 1,2 DCE (Total) ROs based on cis-1,2 DCE (more conservative than trans-1,2 DCE).

6) Due to averaging of results all concentrations are presented to the nearest 0.001

7) Soil Averaging assumes the interval 0-32 feet except S1 which is 0-34 feet.

8) Bold cell border indicates target excavation depth

TABLE 2.3
ESTIMATE OF TETRACHLOROETHENE MASS IN SOIL
OUTSIDE STORAGE AREA
PRE AND POST EXCAVATION
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

Subarea and Boring Location Number	Average Concentration (mg/kg)	Estimate of Soil Mass in Place (kg)	Estimate of PCE Mass in Place (mg)	Target Excavation Depth (ft)	Average Post Excavation Concentration (mg/kg)	Estimate of Mass Impacted Soil Remaining in Place (kg)	Estimate of Mass of PCE Remaining in Place (mg)	Percentage of PCE Mass Remaining	Percentage of Mass Reduction by Excavation
S-1	32.070	704389	22589755	6	0.238	572316	136211	0.006	0.994
S-2	21.660	991362	21472907	4	0.351	867442	304472	0.014	0.986
S-3	1.340	588621	788753	4	0.099	515044	50989	0.065	0.935
S-4	0.940	712542	669789	4	0.304	623474	189536	0.283	0.717
S-5	1.170	712542	833674	6	0.591	578940	342154	0.410	0.590
S-6	0.034	391327	13305	4	0.026	342411	8903	0.669	0.331
S-7	3.300	635907	2098492	4	0.035	556418	19475	0.009	0.991
S-8	0.240	562533	135008	4	0.057	492216	28056	0.208	0.792
TOTALS	9.171	5299223	48601684		0.237	4548262	1079796	0.022	0.978

Estimate of PCE in Soil:

48.602	kg PCE
107.147	lbs PCE
7.885	gallons PCE

Estimate of PCE Remaining in Soil:

1.080	kg PCE
2.381	lbs PCE
0.175	gallons PCE

Notes:

- 1) Average concentration based on 0-32 feet interval. Mass calculations are proportional to length and width of each subarea.
- 2) Uses the TACO Bulk Density for sand of 1.8 g/cm³ which converts to 3033 lbs/yd³.
- 3) 8.337 lbs of water per gallon.
- 4) 1.63 Specific Gravity of PCE and Water 1.00.

Methodology:

- 1) Average Concentrations (mg/kg) = measured during sampling.
- 2) Estimate of Soil Mass in place (kg) = Sub area (ft²) x Depth (ft)/27 (ft³) x 3,033 (lbs/yd³) of sand/2.2046 (lb/kg).
- 3) Estimate of PCE Mass in place (mg) = Average Concentration (mg/kg) x Estimate of Soil Mass in place (kg).
- 4) Target Excavation Depth (ft) = Measured
- 5) Average Post Excavation Concentration (mg/kg) = Measured
- 6) Estimate of Mass Impacted Soil Remaining in Place (kg) = Sub Area (ft²) x [Depth (ft) - Target Excavation Depth (ft)]/27 (ft³) x 3,033 (lbs/yd³) of sand/2.2046 (lb/kg).
- 7) Estimate of Mass of PCE Remaining in Place (mg) = Average Post Excavation Concentration (mg/kg) x Estimate of Mass Impacted Soil Remaining in Place (kg).
- 8) Percentage of PCE Mass Remaining = Estimate of Mass of PCE Remaining in Place (mg)/Estimate of PCE Mass in Place (mg).
- 9) Percentage of Mass Reduction by Excavation = 1-Percentage of PCE Mass Remaining.

Based on the current data, the remaining PCE concentrations in soil are not anticipated to exceed the inhalation or ingestion pathway ROs and will likely be within an order of magnitude of the soil component of the groundwater ingestion pathway RO. The averaged concentrations of cadmium will still exceed the soil component of the groundwater ingestion pathway RO at locations S-4 and S-5 due to elevated concentrations at depth. The averaged lead concentration at S-5 will be 0.008 mg/l and below the soil component of the groundwater ingestion pathway RO of 0.0075 at all other locations.

NATURAL ATTENUATION ENHANCEMENT OPPORTUNITY IDENTIFIED

Based on the information collected in conjunction with the SVE and air sparge pilot tests, there appears to be an opportunity to enhance the natural attenuation in groundwater beneath the OSA. Based on pilot test data, the dissolved oxygen levels in groundwater indicate aerobic conditions. By reducing the dissolved oxygen level in groundwater, anaerobic conditions may be created. These conditions are much more favorable to bacteria which facilitate the reductive dechlorination process.

SECTION 3.0

METHODS AND PROCEDURES

The methods and procedures for completion of the work plan activities including health and safety plan updates, work zone delineation, natural attenuation enhancement, well abandonment, and the excavation, loading, transportation and waste disposal are presented in this section.

HEALTH AND SAFETY PLAN, SITE SECURITY, AND WORK ZONES

The existing SECOR Health and Safety Plan will be revised and updated to include the activities outlined in this work plan. The revisions to the plan will include, but are not limited to, excavation activities, field monitoring equipment and activities, required personal protective equipment (PPE), minimum levels of protection and criteria for upgrade, and excavation sampling procedures.

Site security and work zones will be established. HS has security personnel that restrict access to the facility. There is a guard post located south of the OSA. The chain link security fence around the OSA will be partially removed to facilitate the excavation activities and integration of the area into the facility after completion of the work. Temporary fencing will be used to create exclusion and decontamination zones around the OSA and to block access from HS personnel and others. Permission to close the sidewalk and perhaps a portion of a drive lane on 9th Street adjacent to the OSA will be sought from the City of Rockford. If roadway closure is granted by the City of Rockford, a larger exclusion area will be created using the aforementioned fencing and appropriate lane closure signage (based on current IDOT standards). A site layout identifying the approximate exclusion, decontamination, and support work zones is provided as Figure 3.1.

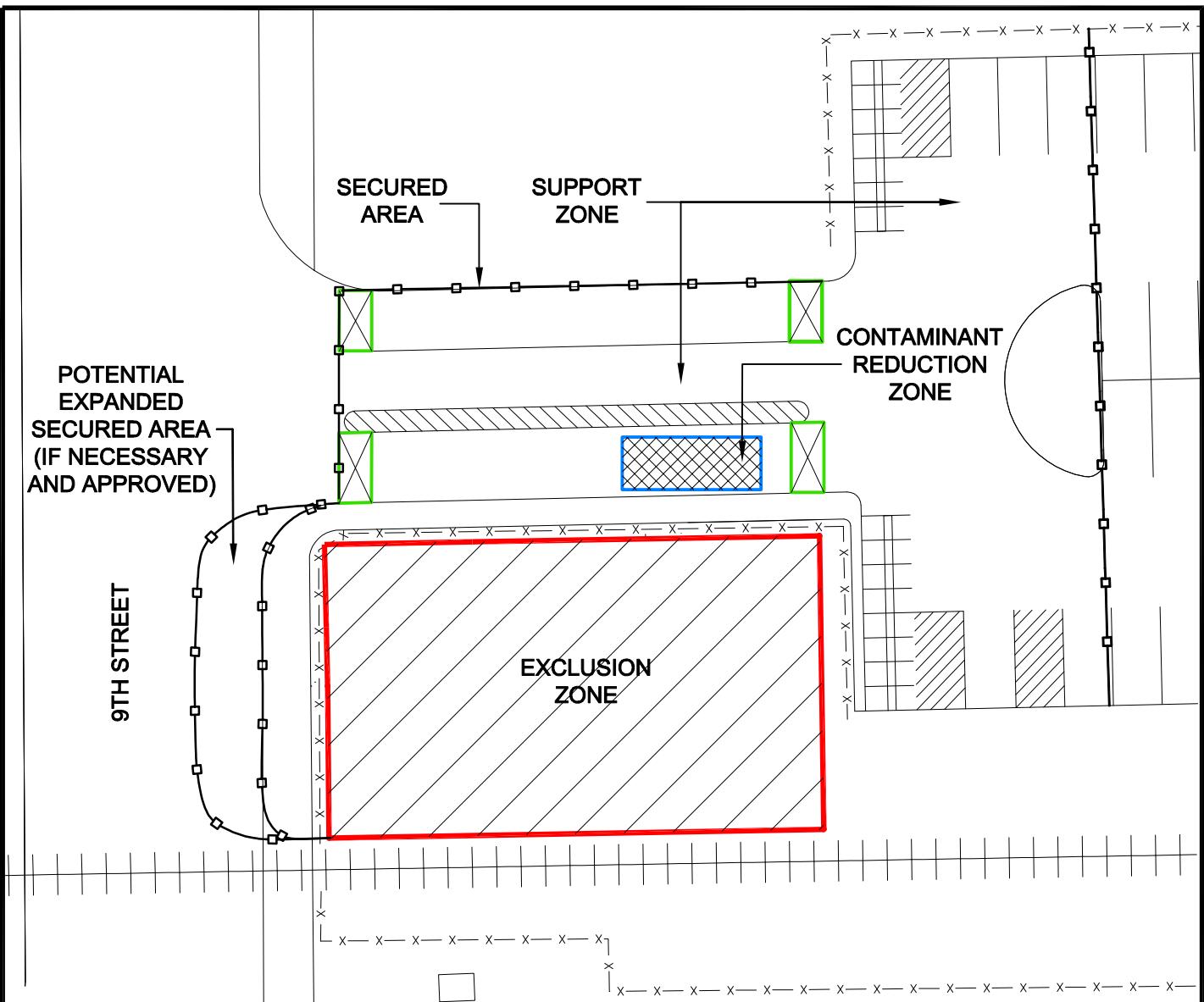
The proximity of the excavation to structures and utilities will require that special care be taken to avoid damaging or in any way compromising the integrity of the adjacent infrastructure. In some areas, excavation walls may require shoring, benching or sloping. This may limit the depth or areal extent of excavations.

All excavations shall be made in accordance with the rules, regulations, requirements, and guidelines set forth in 29 CFR 1926.650, .651, and .652; the Occupational Safety and Health Administration's standard on Excavations.

Excavations will be inspected by a competent person to assure that side walls are stable and do not pose a threat to personnel, equipment, or surrounding infrastructure. Inspections will be conducted on the following schedule, at a minimum:

- Daily and before the start of each shift.
- As dictated by the work being done.
- After every rain storm.
- After other events that could increase hazards, such as snowstorm, windstorm, thaw, earthquake, dramatic change in weather, etc.
- When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur.
- When there is any indication of change or movement in adjacent structures.

Upon completion of the excavation, backfilling, and transportation of all wastes offsite, all temporary fencing will be removed. During the excavation activities, portions of the security fence may be removed to facilitate the completion of the work. If this is necessary, adequate substitute fencing will be provided as necessary to restrict access.



LEGEND:

- ACCESS CONTROL POINTS
- DECONTAMINATION STATION/PAD
- x - x - x - CHAIN-LINK FENCE
- □ - □ - TEMPORARY FENCING
- + + + RAILROAD TRACK

NOTE: THE LOCATIONS AND BOUNDARIES
OF THE WORK ZONES ARE APPROXIMATE
AND SUBJECT TO MODIFICATIONS
BASED ON FIELD CONDITIONS.

DESIGNED BY:	KTW
DRAWN BY:	MWB
APPROVED BY:	DMC
DATE:	03-21-05



EXCAVATION WORK ZONES
HAMILTON SUNDSTRAND
ROCKFORD, ILLINOIS
JOB NO. 13UN.02072.05.0001

FIGURE 3.1

NATURAL ATTENUATION ENHANCEMENT

To take advantage of the existing network of pilot testing points/wells in place in the OSA, a groundwater amendment will be introduced to create more favorable natural attenuation conditions. These wells are within or in close proximity of the water table and provide an opportunity to introduce a natural attenuation enhancement product fairly evenly over the OSA area through the existing infrastructure prior to the abandonment of the wells.

A Regenesis® product, Hydrogen Release Compound Extended Release Formula (HRC-X), will be introduced into the groundwater underlying the OSA through the screened portion of the existing access points (wells). HRC-X is a glycerol polylactate product which slowly releases hydrogen into groundwater for an extended period of time and creates anaerobic conditions which facilitate the biodegradation process for chlorinated volatile organic compounds.

The product is a water soluble, non toxic, food-grade material which was designed to be environmentally safe. The exact amount of HRC-X to be introduced will be determined based on the presence and levels of other electron acceptors in groundwater such as dissolved oxygen, nitrate, iron, manganese, and sulfate. Groundwater information and analytical data for these parameters will be collected prior to field application. HRC-X is anticipated to create even more favorable conditions for natural attenuation. Information regarding the HRC-X product and a generic spreadsheet used to determine an appropriate amount of product for introduction into the groundwater is provided in Appendix B. Additional information is also available at www.regenesis.com. HRC-X is a viscous liquid. To facilitate introduction into the subsurface through the existing wells it will be mixed with water to reduce its viscosity. The HRC-X mixture will be introduced to the wells using a GS200 grout pump (or equivalent).

WELL ABANDONMENT

The existing wells in the OSA will be abandoned in accordance with the Illinois Water Well Construction Code Section 920.120 in preparation for the excavation activities. The soil vapor extraction, air sparge, vacuum monitoring, and air sparge monitoring wells or points with a depth greater than five feet will be properly abandoned by filling the well annulus with a cement bentonite slurry installed via tremie pipe to a depth of four feet bgs. The near ground surface portion of the well risers will be removed in connection with the OSA excavation activities. The shallow wells (five feet or less in depth) will be completely removed as part of the excavation activities.

WASTE CHARACTERIZATION

There is a waste characterization profile from previous investigation work in the OSA that is active and current. SECOR will confirm acceptance of the excavation waste material under the existing profile with the selected disposal facility or determine if additional characterization is required. If necessary, waste characterization samples will be collected and analyzed and submitted to the hazardous waste disposal facility for acceptance. The material will be manifested and shipped under characteristically hazardous waste code F002 or other as determined by the characterization analysis.

EXTENT OF PLANNED EXCAVATION ACTIVITIES AND CONSTRAINTS

The extent of planned excavation will be the entire OSA area to the target depths identified. The excavation area is bounded immediately to the west by a public sidewalk and right of way which contains utilities, to the south by a local spur line of the Illinois Central Railroad, to the east by a grass and landscaped area, and to the north by an asphalt access road to the HS employee parking lot. Prior to commencing the work, a public utility locate via the JULIE one call system will be made as well as a private utility locate for onsite utilities.

There are two primary factors that will present constraints on the excavation activities:

- 1) Health and safety considerations – a potential exists of undermining utilities, sidewalk, roadways, and railroad tracks adjacent to the OSA endangering SECOR employees, subcontractors, HS employees, and the general public. The cohesiveness of the site soils, soil moisture content, and weather conditions at the time of excavation will all be factors in how complete excavation can be made up to the perimeter of the OSA.
- 2) Property boundary, existing right of way (public and railroad) and utility easements – the structural integrity of existing infrastructure (utilities, sidewalk, railroad tracks) must not be compromised. The HS property lines, identified site and public utilities, and surface infrastructure (sidewalk, roads, etc.) are shown on Figure 1.3.

To address these concerns the soil excavation may be sloped, benched, spot dug and backfilled, or temporary supporting structures (trench box or excavation shield) may be used to minimize the potential for: 1) excavation wall collapse, 2) potential undermining the stability of the excavation equipment, or 3) potential damage to public or private infrastructure (utilities, sidewalk, road, rail line).

EXCAVATION EQUIPMENT, LOADING, AND TRANSPORT

The excavation work will be completed using a track backhoe excavator (or equivalent). The concrete pad will be scored with a concrete saw and broken into manageable pieces using a backhoe as part of excavation activities. The concrete and impacted gravel will be disposed along with the waste material. The excavated soil will be loaded into lined container boxes with tarps or loaded directly into trucks with lined boxes with tarps. The trucks for transport will remain outside of the OSA. The material will be transported by truck to the designated facility.

HAZARDOUS WASTE DISPOSAL

The waste will be shipped to a HS approved hazardous waste disposal facility. HS has contractual agreements with a number of disposal facilities. Once final selection of the disposal facility is confirmed and the waste is accepted for shipment SECOR will provide this information to the IEPA.

DECONTAMINATION

A temporary decontamination pad will be established in the HS paved area to the north of the OSA. A pad made with impermeable polyethylene sheeting will be placed on the asphalt and sloped for water collection. All excavation equipment will be decontaminated using a steam cleaner and/or pressure washing equipment. The decontamination water will be containerized and staged within the decontamination or exclusion zone. Upon project completion (or before as necessary) the wastewater will be characterized, transported offsite, and properly disposed at a UTC approved facility. All soil from decontamination activities will be disposed along with the site soils.

Work-generated solid waste (used PPE, plastic sheeting, etc.) will be visually inspected. If inspection indicates the materials may be contaminated, it will be disposed along with the waste material. If no evidence of contamination is present, the materials will be double bagged (trash bags) and disposed in an onsite dumpster for ultimate disposal in a sanitary landfill.

EXCAVATION SAMPLING

Upon completion of excavation activities in a specific area, base and wall samples, as appropriate, will be collected. The soil samples will be obtained using the backhoe bucket or other sample collection device, as appropriate. Personnel will not enter the excavation for sampling activities at any location greater than four feet deep. Samples will be collected halfway up the sidewall whether vertical or sloped. Base and wall samples will be collected on approximately 20 feet intervals. At a minimum, three

samples from each wall will be collected for a total of 12 wall samples around the perimeter of the OSA. Base samples will also be collected on approximately 20 feet centers. This is estimated to result in a total of nine base samples. The base samples will likely be at different depths below ground surface as the target excavation depths will vary. Representative wall and base sample locations are shown on Figure 3.2. Representative samples will be collected at locations based on the criteria in the following order: 1) safe sample collection, 2) location and depth of base or wall face area for that portion of the excavation, 3) visual or PID indication of impact. Actual sample locations will be based on the post-excavation dimensions.

Samples will be collected, packaged, and preserved in the same manner described in the approved Field Sampling Plan for drilling soil samples with the exception that these samples will be collected by other than drilling equipment. Two soil duplicate samples (1 per 20 samples) for Quality Assurance/Quality Control (QA/QC) are planned. The laboratory will run and report MS/MSD analyses on a 1 per 20 sample basis. No field sampling blanks will be collected. Trip blanks will accompany each shipment of samples sent for analysis. The samples will be submitted to STL Laboratories in University Park, Illinois for the target analyses (VOCs, TCLP metals). No TPH DRO analysis is warranted as the comprehensive sampling completed as part of the Pre-Design Investigation in this area had no TPH DRO detections in any of the samples.

The samples will be identified using the following nomenclature which has been slightly modified from the Field Sampling Plan (FSP) protocol.

OSA - SR- MMYY -W1

Whereas: OSA = Outside Storage Area

OSA – SR – MMYY –B1

SR = Source Reduction

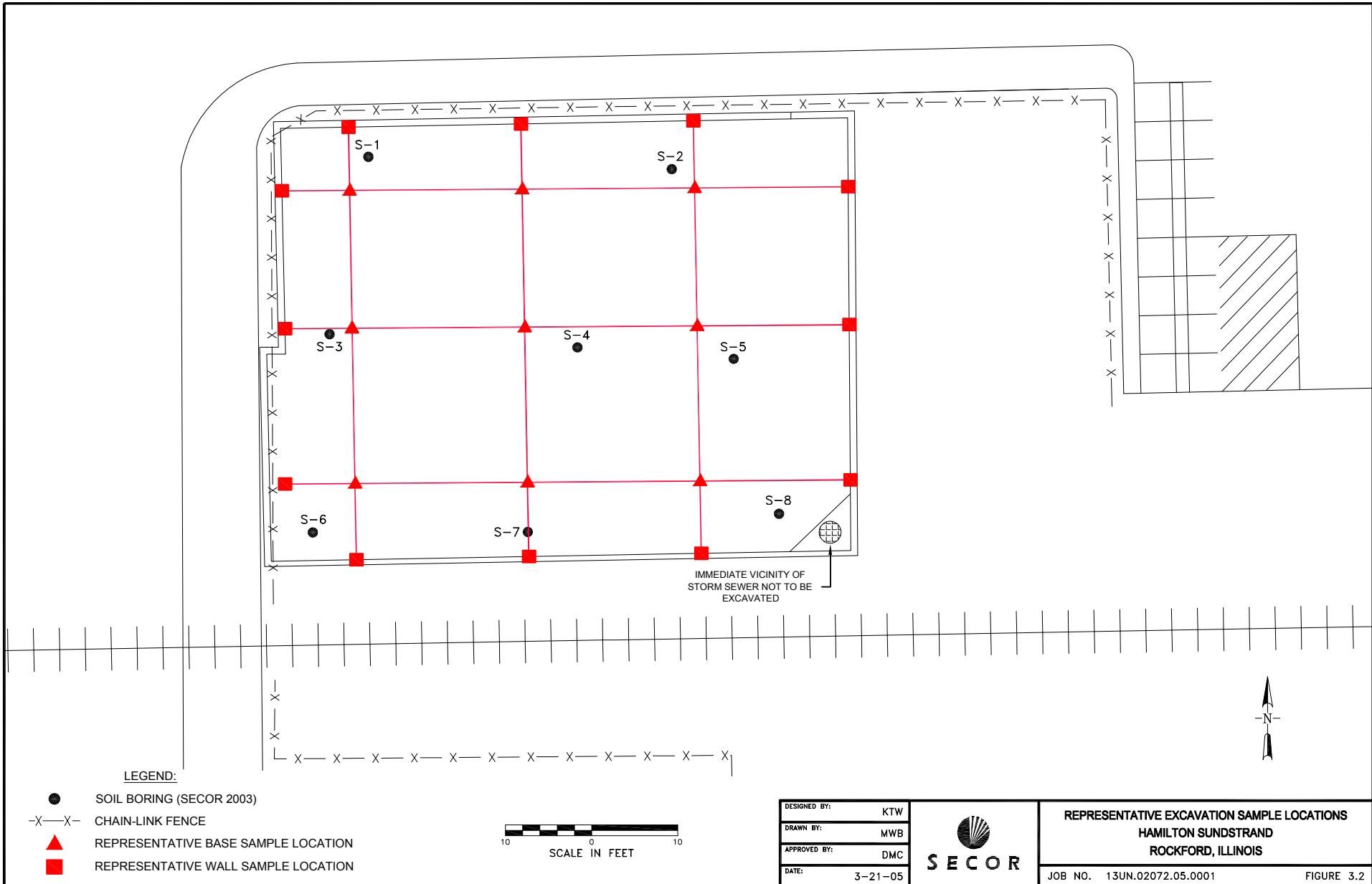
MM = Month

YY = Year

W = Wall Sample

B = Base Sample

1 = Sequential Numbers



EXCAVATION BACKFILLING

The timing and manner of backfill placement will be dictated by the actual site and soil conditions. If existing infrastructure or utilities are considered vulnerable, backfill placement will be completed immediately following the excavation and sampling activities. The excavation will be backfilled with clean fill material from a documented source. At a minimum, the top three feet of fill will be a clay matrix soil. In the past, one or more feet of clean pea gravel was placed over the concrete pad and OSA area for aesthetic purposes. Some of this material may be used for deeper backfill as deemed appropriate.

CLAY CAP PLACEMENT

The top three feet of backfill material will be clean clay matrix soil. The soil will be placed in one foot lifts over the excavated area and compacted with the excavating equipment. The area may then be top dressed with suitable topsoil and seeded with grass to minimize erosion and for aesthetic purposes.

SECTION 4.0

DOCUMENTATION

After completion of the SMMRWP activities, a summary report documenting the work will be prepared. The report will consist of a brief narrative of the natural attenuation enhancement data collection and HRC-X introduction, well abandonment, excavation, and backfilling activities. The report will also include a figure identifying the actual boundary of the OSA excavation activities, a presentation of all analytical data in tabular format, a comparison of the analytical results with TACO ROs, well abandonment documentation, and a summary of all material transported on and offsite. The following provides additional description of several key portions of the report.

NATURAL ATTENUATION ENHANCEMENT

A summary of the activities completed to enhance the natural attenuation in the area will be provided including the field measurements and analytical results of groundwater electron acceptors, the amount of HRC-X supplied, the completed HRC-X calculation worksheet, and a narrative of the introduction method.

WELL ABANDONMENT

A narrative of the procedure and completed Illinois Department of Public Health water well abandonment forms will be provided.

EXCAVATION MASS REDUCTION ACTIVITY REPORTING

The actual excavation area in both areal extent and vertically by subarea will be documented. This will be correlated with the volume/weight of the material transported offsite under manifest. Copies of the waste manifests will be provided. The soil volume and contaminant concentrations previously documented will allow for an estimation of the mass reduction accomplished by this effort.

EXCAVATION SAMPLING ANALYSIS AND EVALUATION

The report will provide a summary of the excavation wall and base sample data and a comparison of those concentrations with 35 IAC 742 TACO ROs, the ROs specified in the ROD, and those identified in subsequent IEPA correspondence dated July 22, 2004.

EXCAVATION BACKFILL AND CLAY CAP CONSTRUCTION

The source(s), types, and volumes of backfill material will documented and summarized. The manner of placement of the clay material and means of compaction will also be provided.

PHOTOGRAPHIC DOCUMENTATION

Photographic documentation of the OSA prior to, during, and after completion of the activities in this work plan will be provided.

APPENDIX A

OSA Soil Investigation Analytical Results October 2003 Summary Tables

S-1
SOIL ANALYTICAL RESULTS - VOCs, RCRA METALS, DRO/JP-4
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

SAMPLE IDENTIFICATION	*35 IAC 742 SOIL OBJECTIVES	RD-SB-S1(2-4)-01	RD-SB-S1(4-6)-01	RD-SB-S1(6-8)-01	RD-SB-S1(8-10)-01	RD-SB-S1(10-12)-01	RD-SB-S1(12-14)-01	RD-SB-S1(14-16)-01	RD-SB-S1(16-18)-01	RD-SB-S1(18-20)-01	RD-SB-S1(20-22)-01	RD-SB-S1(22-24)-01	RD-SB-S1(24-26)-01	RD-SB-S1(26-28)-01	RD-SB-S1(28-30)-01	RD-SB-S1(30-32)-01	RD-SB-S1(32-34)-01
		RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD
SAMPLE LOCATION		S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1	S-1
SAMPLE DEPTH (feet)		2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32	32-34
SAMPLE DATE		10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03
VOCs - Method 8260B	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Acetone	16	<0.44	<0.41	<0.090	<0.0051	<0.0051	0.018	<0.0048	0.013	0.01	<0.0051	<0.0056	0.0092	0.0068	<0.0053	0.018	0.012
Benzene	0.03	<0.11	<0.10	<0.022	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Bromodichloromethane	0.6	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	0.021	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Bromoform	0.8	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Bromomethane	0.2	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Carbon Disulfide	32	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Carbon Tetrachloride	0.07	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Chlorobenzene	1	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Chloroethane	NL	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Chloroform	0.3	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Chloromethane	NL	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Dibromochloromethane	0.4	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
1,1-Dichloroethane	23	7.6	11	0.23	<0.0051	<0.0051	0.011	0.0082	<0.0094	0.017	0.12	<0.0056	0.015	<0.0053	<0.0053	<0.0052	<0.0054
1,2-Dichloroethane	0.02	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	0.0072	<0.0053	<0.0053	<0.0052	<0.0054
1,1-Dichloroethene	0.06	<0.44	0.56	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
1,2-Dichloroethene (total)	0.4	12	9.4	0.28	0.019	0.0061	0.014	0.012	0.011	0.024	0.13	<0.0056	0.022	<0.0053	<0.0053	<0.0052	<0.0054
1,2-Dichloropropane	0.03	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
cis-1,3-Dichloropropene	0.004	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
trans-1,3-Dichloropropene	0.004	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Ethylbenzene	13	<0.11	<0.10	<0.022	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
2-Hexanone	NL	<0.44	<0.41	<0.090	<0.0051	<0.0051	0.032	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
MEK	17	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Methylene Chloride	0.02	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
MIBK	2.5	<0.44	<0.41	<0.090	<0.0051	<0.0051	<0.0047	<0.0048	<0.0094	<0.0072	<0.0051	<0.0056	<0.0049	<0.0053	<0.0053	<0.0052	<0.0054
Styrene	4	<0.44	<0.41	<0.090	<												

S-2
SOIL ANALYTICAL RESULTS - VOCs, RCRA METALS, DRO/JP-4
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

SAMPLE IDENTIFICATION	*35 IAC 742 SOIL OBJECTIVES															
		RD-SB-S2(2-4)-01	RD-SB-S2(4-6)-01	RD-SB-S2(6-8)-01	RD-SB-S2(8-10)-01	RD-SB-S2(10-12)-01	RD-SB-S2(12-14)-01	RD-SB-S2(14-16)-01	RD-SB-S2(16-18)-01	RD-SB-S2(18-20)-01	RD-SB-S2(20-22)-01	RD-SB-S2(22-24)-01	RD-SB-S2(24-26)-01	RD-SB-S2(26-28)-01	RD-SB-S2(28-30)-01	RD-SB-S2(30-32)-01
SAMPLE LOCATION		S-2	S-2	S-2	S-2	S-2	S-2	S-2	S-2	S-2	S-2	S-2	S-2	S-2	S-2	
SAMPLE DEPTH (feet)		2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32
SAMPLE DATE		10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	
VOCs - Method 8260B	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Acetone	16	<0.17	<0.094	0.014	<0.048	0.050	<0.048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	0.048	<0.0052	0.011
Benzene	0.03	<0.042	<0.023	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.022	<0.025	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Bromodichloromethane	0.6	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Bromoform	0.8	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Bromomethane	0.2	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Carbon Disulfide	32	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Carbon Tetrachloride	0.07	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Chlorobenzene	1	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Chloroethane	NL	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Chloroform	0.3	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Chloromethane	NL	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Dibromochloromethane	0.4	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
1,1-Dichloroethane	23	8.1	<0.094	0.0068	<0.0048	<0.0046	0.0097	0.0058	<0.0076	0.11	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
1,2-Dichloroethane	0.02	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
1,1-Dichloroethene	0.06	1.3	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
1,2-Dichloroethene (total)	0.4	7.2	0.28	0.030	0.013	0.011	0.026	0.016	0.010	0.32	0.21	0.0081	<0.0051	<0.0051	0.0058	<0.0049
1,2-Dichloropropane	0.03	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
cis-1,3-Dichloropropene	0.004	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
trans-1,3-Dichloropropene	0.004	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Ethylbenzene	13	<0.042	<0.023	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.022	<0.025	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
2-Hexanone	NL	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
MEK	17	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	0.0081	<0.0052	<0.0049
Methylene Chloride	0.02	<0.17	<0.094	0.012	<0.0048	<0.0046	<0.0048	<0.0049	0.011	<0.090	<0.10	0.0098	<0.0051	<0.0051	<0.0052	<0.0049
MIBK	2.5	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Styrene	4	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
1,1,2,2-Tetrachloroethane	NL	<0.17	<0.094	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.0076	<0.090	<0.10	<0.0051	<0.0051	<0.0051	<0.0052	<0.0049
Tetrachloroethene	0.06	320	1.1	0.12	0.12	0.087	0.15	0.14	0.19	1.8	0.89	0.098	0.055	0.040	0.074	0.048
Toluene	12	0.54	<0.023	<0.0047	<0.0048	<0.0046	<0.0048	<0.0049	<0.							

S-3
SOIL ANALYTICAL RESULTS - VOCs, RCRA METALS, DRO/JP-4
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

SAMPLE LOCATION	*35 IAC 742 SOIL OBJECTIVES	RD-SB-S3(0-2)-01	RD-SB-S3(2-4)-01	RD-SB-S3(4-6)-01	RD-SB-S3(6-8)-01	RD-SB-S3(8-10)-01	RD-SB-S3(10-12)-01	RD-SB-S3(12-14)-01	RD-SB-S3(14-16)-01	RD-SB-S3(16-18)-01	RD-SB-S3(18-20)-01	RD-SB-S3(20-22)-01	RD-SB-S3(22-24)-01	RD-SB-S3(24-26)-01	RD-SB-S3(24-26)-01	RD-SB-S3(26-28)-01	RD-SB-S3(28-30)-01	RD-SB-S3(30-32)-01
		RD-SB-S3(0-2)-01	RD-SB-S3(2-4)-01	RD-SB-S3(4-6)-01	RD-SB-S3(6-8)-01	RD-SB-S3(8-10)-01	RD-SB-S3(10-12)-01	RD-SB-S3(12-14)-01	RD-SB-S3(14-16)-01	RD-SB-S3(16-18)-01	RD-SB-S3(18-20)-01	RD-SB-S3(20-22)-01	RD-SB-S3(22-24)-01	RD-SB-S3(24-26)-01	RD-SB-S3(24-26)-01	RD-SB-S3(26-28)-01	RD-SB-S3(28-30)-01	RD-SB-S3(30-32)-01
SAMPLE LOCATION		S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	S-3	
SAMPLE DEPTH (feet)		0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	24-26	26-28	28-30	30-32
SAMPLE DATE		10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	10/28/03	
VOCs - Method 8260B	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Acetone		16	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	0.0058	<0.0053	<0.0049	<0.0045
Benzene		0.03	<0.081	<0.030	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.023	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Bromodichloromethane		0.6	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Bromoform		0.8	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Bromomethane		0.2	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Carbon Disulfide		32	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Carbon Tetrachloride		0.07	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Chlorobenzene		1	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Chloroethane		NL	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Chloroform		0.3	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Chloromethane		NL	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Dibromochloromethane		0.4	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
1,1-Dichloroethane		23	0.10	1.3	0.058	<0.0049	<0.0050	0.010	0.0082	<0.0053	<0.0049	0.12	0.036	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
1,2-Dichloroethane		0.02	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
1,1-Dichloroethene		0.06	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
1,2-Dichloroethene (total)		0.4	<0.081	0.75	0.040	<0.0049	<0.0050	0.0092	0.0086	<0.0053	<0.0049	0.11	0.027	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
1,2-Dichloropropane		0.03	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
cis-1,3-Dichloropropene		0.004	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
trans-1,3-Dichloropropene		0.004	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
Ethylbenzene		13	<0.081	<0.030	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.023	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
2-Hexanone		NL	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	<0.0053	<0.0053	<0.0049	<0.0045	<0.0051
MEK		17	<0.081	<0.12	<0.0044	<0.0049	<0.0050	<0.0047	<0.0049	<0.0053	<0.0049	<0.091	<0.0050	0.0054	<0.0053	<0.0053	<0.0049	<0.0045
Methylene Chloride		0.02	<0.081	<0.12	<0.0044	<0.0049	0.0054	0.010	0.0077	<0.0								

S-4
SOIL ANALYTICAL RESULTS - VOCs, RCRA METALS, DRO/JP-4
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

SAMPLE LOCATION	*35 IAC 742 SOIL OBJECTIVES	RD-SB-S4(0-2)-01	RD-SB-S4(2-4)-01	RD-SB-S4(4-6)-01	RD-SB-S4(6-8)-01	RD-SB-S4(8-10)-01	RD-SB-S4(10-12)-01	RD-SB-S4(12-14)-01	RD-SB-S4(16-18)-01	RD-SB-S4(18-20)-01	RD-SBD-S4(18-20)-01	RD-SB-S4(20-22)-01	RD-SB-S4(22-24)-01	RD-SB-S4(24-26)-01	RD-SB-S4(26-28)-01	RD-SB-S4(28-30)-01	RD-SB-S4(30-32)-01
		S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4
SAMPLE LOCATION		S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4	S-4
SAMPLE DEPTH (feet)		0-2	2-4	4-6	6-8	8-10	10-12	12-14	16-18	18-20	18-20	20-22	22-24	24-26	26-28	28-30	30-32
SAMPLE DATE		10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03
VOCs - Method 8260B	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Acetone	16	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	0.017	<0.0045
Benzene	0.03	<0.025	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.025	<0.093	<0.021	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Bromodichloromethane	0.6	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Bromoform	0.8	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Bromomethane	0.2	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Carbon Disulfide	32	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Carbon Tetrachloride	0.07	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Chlorobenzene	1	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Chloroethane	NL	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Chloroform	0.3	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Chloromethane	NL	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Dibromochloromethane	0.4	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
1,1-Dichloroethane	23	<0.10	0.17	0.31	0.032	<0.0053	<0.0051	0.0073	<0.0057	0.13	0.10	0.18	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
1,2-Dichloroethane	0.02	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
1,1-Dichloroethene	0.06	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
1,2-Dichloroethene (total)	0.4	0.30	0.45	<0.0096	0.078	<0.0053	0.0071	0.017	0.01	0.31	0.24	0.38	<0.0053	<0.0052	<0.0049	0.0051	0.0062
1,2-Dichloropropane	0.03	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
cis-1,3-Dichloropropene	0.004	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
trans-1,3-Dichloropropene	0.004	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Ethylbenzene	13	<0.025	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.021	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
2-Hexanone	NL	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
MEK	17	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Methylene Chloride	0.02	<0.10	<0.092	0.012	0.011	0.0082	<0.0051	0.0094	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	0.0075
MIBK	2.5	<0.10	<0.092	<0.0096	<0.0044	<0.0053	<0.0051	<0.0051	<0.0057	<0.10	<0.093	<0.085	<0.0053	<0.0052	<0.0049	<0.0050	<0.0045
Styrene	4	<0.10	<0.092	<0.0096	<0.0044	<0.0											

S-5
SOIL ANALYTICAL RESULTS - VOCs, RCRA METALS, DRO/JP-4
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

SAMPLE LOCATION	*35 IAC 742 SOIL OBJECTIVES	RD-SB-S5(2-4)-01	RD-SB-S5(4-6)-01	RD-SB-S5(6-8)-01	RD-SB-S5(8-10)-01	RD-SB-S5(10-12)-01	RD-SB-S5(12-14)-01	RD-SB-S5(14-16)-01	RD-SB-S5(16-18)-01	RD-SB-S5(18-20)-01	RD-SB-S5(20-22)-01	RD-SB-S5(22-24)-01	RD-SB-S5(24-26)-01	RD-SB-S5(26-28)-01	RD-SB-S5(28-30)-01	RD-SB-S5(30-32)-01
SAMPLE LOCATION		S-5	S-5	S-5	S-5	S-5	S-5	S-5	S-5	S-5	S-5	S-5	S-5	S-5	S-5	
SAMPLE DEPTH (feet)		2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32
SAMPLE DATE		10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03
VOCs - Method 8260B	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Acetone	16	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	0.0068	<0.0049	<0.0050	<0.0047	<0.0048
Benzene	0.03	<0.023	<0.021	<0.019	<0.0050	<0.025	<0.0045	<0.0049	<0.0052	<0.023	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Bromodichloromethane	0.6	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Bromoform	0.8	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Bromomethane	0.2	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Carbon Disulfide	32	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Carbon Tetrachloride	0.07	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Chlorobenzene	1	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Chloroethane	NL	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Chloroform	0.3	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Chloromethane	NL	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Dibromochloromethane	0.4	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
1,1-Dichloroethane	23	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	0.055	<0.0050	<0.0049	0.0053	<0.0047	<0.0048
1,2-Dichloroethane	0.02	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
1,1-Dichloroethene	0.06	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
1,2-Dichloroethene (total)	0.4	<0.090	0.097	<0.077	<0.0050	<0.10	0.0071	0.0056	0.0069	0.11	0.13	0.0075	<0.0049	0.011	0.0079	0.0092
1,2-Dichloropropane	0.03	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
cis-1,3-Dichloropropene	0.004	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
trans-1,3-Dichloropropene	0.004	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Ethylbenzene	13	<0.023	<0.021	<0.019	<0.0050	<0.025	<0.0045	<0.0049	<0.0052	<0.023	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
2-Hexanone	NL	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
MEK	17	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Methylene Chloride	0.02	<0.090	<0.085	0.077	0.013	<0.10	0.0055	0.0049	0.011	<0.091	<0.0050	0.012	0.0072	<0.0050	<0.0047	0.0066
MIBK	2.5	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Styrene	4	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
1,1,2,2-Tetrachloroethane	NL	<0.090	<0.085	<0.077	<0.0050	<0.10	<0.0045	<0.0049	<0.0052	<0.091	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Tetrachloroethene	0.06	1.7	8.1	2.5	0.93	1.6	0.10	0.12	0.17	1.1	0.89	0.058	0.045	0.058	0.051	0.055
Toluene	12	<0.023	<0.021	<0.019	<0.0050	<0.025	<0.0045	<0.0049	<0.0052	<0.023	<0.0050	<0.0050	<0.0049	<0.0050	<0.0047	<0.0048
Total Xylenes																

S-6
SOIL ANALYTICAL RESULTS - VOCs, RCRA METALS, DRO/JP-4
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

SAMPLE LOCATION	*35 IAC 742 SOIL OBJECTIVES	RD-SB-S6(0-2)-01	RD-SB-S6(2-4)-01	RD-SB-S6(4-6)-01	RD-SB-S6(6-8)-01	RD-SB-S6(8-10)-01	RD-SB-S6(10-12)-01	RD-SB-S6(12-14)-01	RD-SB-S6(14-16)-01	RD-SB-S6(16-18)-01	RD-SB-S6(18-20)-01	RD-SB-S6(20-22)-01	RD-SB-S6(22-24)-01	RD-SB-S6(24-26)-01	RD-SB-S6(26-28)-01	RD-SB-S6(28-30)-01	RD-SB-S6(30-32)-01	
SAMPLE LOCATION		S-6	S-6	S-6	S-6	S-6	S-6	S-6	S-6	S-6	S-6	S-6	S-6	S-6	S-6	S-6		
SAMPLE DEPTH (feet)		0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	26-28	28-30	30-32	
SAMPLE DATE		10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	10/29/03	
VOCs - Method 8260B	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Acetone		16	0.049	<0.0047	0.059	0.043	0.034	0.023	0.034	0.019	0.027	0.028	0.016	0.015	0.024	0.026	0.022	0.025
Benzene		0.03	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Bromodichloromethane		0.6	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Bromoform		0.8	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Bromomethane		0.2	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Carbon Disulfide		32	<0.0050	0.0094	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Carbon Tetrachloride		0.07	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Chlorobenzene		1	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Chloroethane		NL	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Chloroform		0.3	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Chloromethane		NL	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Dibromochloromethane		0.4	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
1,1-Dichloroethane		23	<0.0050	0.0089	0.018	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
1,2-Dichloroethane		0.02	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
1,1-Dichloroethene		0.06	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
1,2-Dichloroethene (total)		0.4	<0.0050	<0.0047	0.011	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
1,2-Dichloropropane		0.03	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
cis-1,3-Dichloropropene		0.004	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
trans-1,3-Dichloropropene		0.004	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Ethylbenzene		13	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
2-Hexanone		NL	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
MEK		17	<0.0050	<0.0047	<0.0044	<0.0052	0.0057	0.0061	0.0069	<0.0051	0.0068	0.0066	<0.0050	<0.0053	<0.0050	0.0063	0.0049	0.0066
Methylene Chloride		0.02	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
MIBK		2.5	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Styrene		4	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
1,1,2,2-Tetrachloroethane		NL	<0.0050	<0.0047	<0.0044	<0.0052	<0.0050	<0.0049	<0.0044	<0.0051	<0.0050	<0.0056	<0.0050	<0.0053	<0.0050	<0.0054	<0.0042	<0.0051
Tetrachloroethene		0.06																

S-7
SOIL ANALYTICAL RESULTS - VOCs, RCRA METALS, DRO/JP-4
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

SAMPLE LOCATION	*35 IAC 742 SOIL OBJECTIVES																		
		RD-SB-S7(2-4)-01	RD-SBD-S7(2-4)-01	RD-SB-S7(4-6)-01	RD-SB-S7(6-8)-01	RD-SB-S7(8-10)-01	RD-SB-S7(10-12)-01	RD-SB-S7(12-14)-01	RD-SB-S7(14-16)-01	RD-SB-S7(16-18)-01	RD-SB-S7(18-20)-01	RD-SB-S7(20-22)-01	RD-SB-S7(22-24)-01	RD-SB-S7(24-26)-01	RD-SBD-S7(24-26)-01	RD-SB-S7(26-28)-01	RD-SB-S7(28-30)-01	RD-SB-S7(30-32)-01	
SAMPLE LOCATION		S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7	S-7		
SAMPLE DEPTH (feet)		2-4	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	24-26	24-26	26-28	28-30	30-32	
SAMPLE DATE		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	
VOCs - Method 8260B	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Acetone	16	<0.095	<0.11	0.071	0.044	0.036	0.025	0.010	<0.0052	<0.0053	<0.0054	0.018	0.013	0.020	0.014	0.014	0.017	0.020	
Benzene	0.03	<0.024	<0.029	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0052	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Bromodichloromethane	0.6	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Bromoform	0.8	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Bromomethane	0.2	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Carbon Disulfide	32	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Carbon Tetrachloride	0.07	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Chlorobenzene	1	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Chloroethane	NL	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Chloroform	0.3	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Chloromethane	NL	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Dibromochloromethane	0.4	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
1,1-Dichloroethane	23	0.37	0.13	0.02	<0.0047	<0.0053	0.0054	<0.0050	<0.0052	<0.0053	0.048	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
1,2-Dichloroethane	0.02	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
1,1-Dichloroethene	0.06	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
1,2-Dichloroethene (total)	0.4	0.22	0.094	0.023	<0.0047	<0.0053	0.0063	<0.0050	<0.0052	<0.0053	0.052	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
1,2-Dichloropropane	0.03	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
cis-1,3-Dichloropropene	0.004	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
trans-1,3-Dichloropropene	0.004	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Ethylbenzene	13	<0.024	<0.029	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
2-Hexanone	NL	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
MEK	17	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052	
Methylene Chloride	0.02	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.0050	<0.0052	<0.0053	0.011	<0.0054	<0.0052	<0.0055	<0.0052	<0.0053	<0.0054	<0.0053	<0.0052
MIBK	2.5	<0.095	<0.11	<0.0058	<0.0047	<0.0053	<0.0053	<0.005											

S-8
SOIL ANALYTICAL RESULTS - VOCs, RCRA METALS, DRO/JP-4
AREA 9/10
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SUPERFUND SITE
ROCKFORD, ILLINOIS

SAMPLE LOCATION	*35 IAC 742 SOIL OBJECTIVES	RD-SB-S8(2-4)-01	RD-SB-S8(4-6)-01	RD-SB-S8(6-8)-01	RD-SB-S8(8-10)-01	RD-SB-S8(8-10)-01	RD-SBD-S8(10-12)-01	RD-SB-S8(12-14)-01	RD-SB-S8(14-16)-01	RD-SB-S8(16-18)-01	RD-SB-S8(18-20)-01	RD-SB-S8(18-20)-01	RD-SB-S8(20-22)-01	RD-SB-S8(22-24)-01	RD-SB-S8(24-26)-01	RD-SB-S8(26-28)-01	RD-SB-S8(28-30)-01	RD-SB-S8(30-32)-01	
		RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD	RD		
SAMPLE LOCATION		S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8	S-8		
SAMPLE DEPTH (feet)		2-4	4-6	6-8	8-10	8-10	10-12	12-14	14-16	16-18	18-20	18-20	20-22	22-24	24-26	26-28	28-30	30-32	
SAMPLE DATE		10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	10/30/03	
VOCs - Method 8260B	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg		
Acetone	16	<0.092	0.052	0.030	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	0.0075	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Benzene	0.03	<0.023	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Bromodichloromethane	0.6	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Bromoform	0.8	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Bromomethane	0.2	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Carbon Disulfide	32	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Carbon Tetrachloride	0.07	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Chlorobenzene	1	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Chloroethane	NL	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Chloroform	0.3	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Chloromethane	NL	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Dibromochloromethane	0.4	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
1,1-Dichloroethane	23	<0.092	0.013	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	0.014	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
1,2-Dichloroethane	0.02	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
1,1-Dichloroethene	0.06	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
1,2-Dichloroethene (total)	0.4	<0.092	0.021	0.0068	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	0.013	0.028	0.0070	<0.0052	<0.0053	0.0060	<0.0051	<0.0052
1,2-Dichloropropane	0.03	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
cis-1,3-Dichloropropene	0.004	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
trans-1,3-Dichloropropene	0.004	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Ethylbenzene	13	<0.023	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
2-Hexanone	NL	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
MEK	17	<0.092	0.0053	0.0048	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.0053	<0.0049	<0.0051	<0.0052	
Methylene Chloride	0.02	<0.092	<0.0047	<0.0045	<0.0051	<0.0048	<0.0043	<0.0049	<0.0050	<0.0052	<0.0055	<0.0046	<0.0041	<0.0052	<0.005				

APPENDIX B

HRC-X Product Information & Calculation Spreadsheet



[eXtended release formula]

HYDROGEN RELEASE COMPOUND (HRC-X™)

[eXtended release formula]

HRC-X is specifically formulated to treat residual DNAPL in groundwater and to provide a long term solution for groundwater contaminant plume control

How it Works

HRC-X is a special formulation of the patented and widely accepted Hydrogen Release Compound (HRC®), which has been successfully applied on hundreds of project sites world-wide for the cost-effective, *in-situ* treatment of groundwater contamination.

HRC-X is a viscous material, composed of glycerol polylactate, which is injected directly into the contaminated subsurface. Once in place, and in the vast majority of cases, HRC-X produces reducing conditions for periods of at least 3 to 5 years. These conditions are created and sustained as a result of lactic acid and ultimately hydrogen, that is released from HRC-X. This hydrogen, in turn, is used by microbes to degrade chlorinated solvent-type contaminants through a well understood process known as reductive dechlorination.

HRC-X can be used to degrade a range of contaminants including: degreasing agents (PCE, TCE, TCA and their breakdown products), carbon tetrachloride, chloroform, perchlorate, nitrate, and certain pesticides/herbicides.

Residual DNAPL Treatment

Residual Dense Non-Aqueous Phase Liquids (DNAPL's) are often difficult to find and very costly to treat. Residual DNAPL causes a lingering and unwanted source of groundwater contamination that can represent enormous and unexpected cleanup costs.

HRC-X is a proven solution to this challenging problem. Once injected into the general vicinity of the residual DNAPL, HRC-X goes to work releasing lactic acid and cost effectively producing the desired hydrogen throughout the area. This, in turn, drives the rapid desorption, dissolution, and degradation of the bound residual DNAPL. (Figure 1).

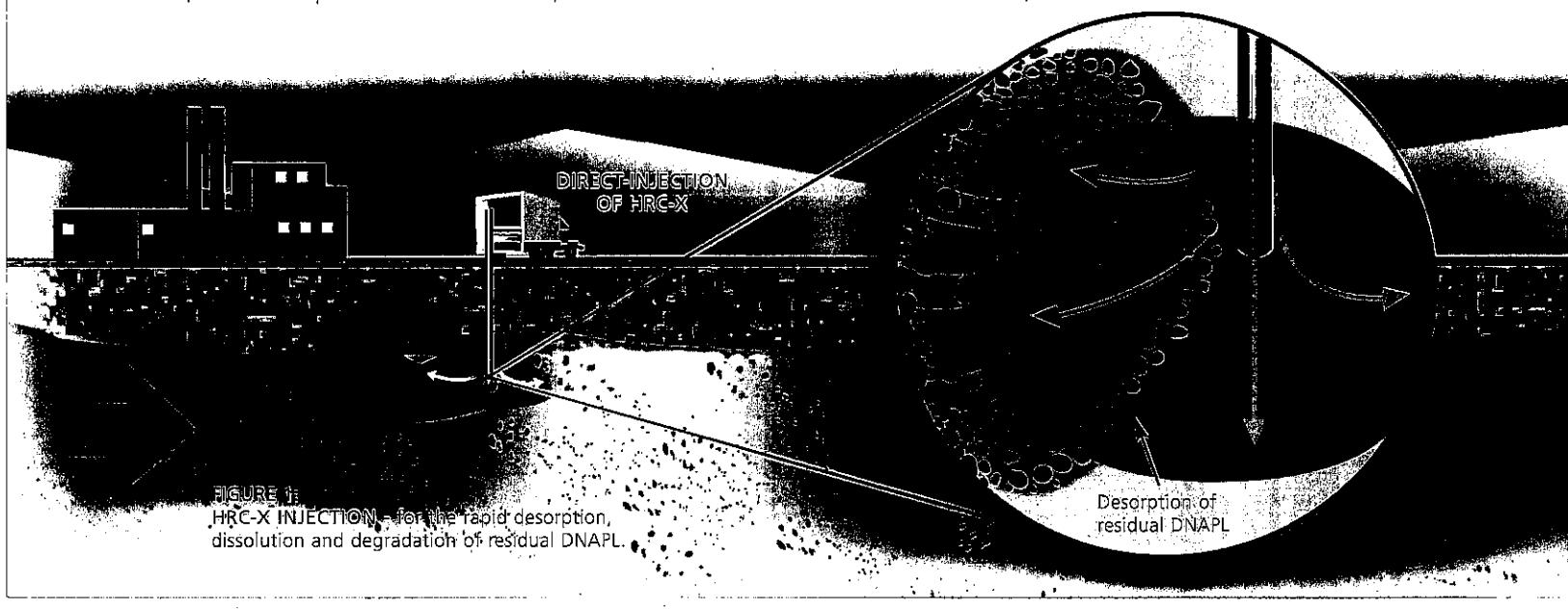
Since HRC-X facilitates a microbial driven process, it can be applied without the need to identify the exact location of the residual DNAPL, avoiding costs associated with detailed site analysis. Additionally, HRC-X does not require stationary equipment, any on-going power supply, piping, long-term operations and maintenance or labor costs. These characteristics alone can significantly reduce the costs of residual DNAPL remediation.

Long Term, Low Cost Plume Control

When long-term plume control is required to halt the migration of groundwater contaminants, HRC-X may be one of the most cost effective alternatives available. In the past, the only alternative in these situations was to cut-off the plume by intercepting the groundwater with very inefficient and costly pump and treat systems, or by disruptive construction of expensive sheet pile barriers and "iron filing walls."

Groundwater remediation professionals now have an effective alternative to offer their clients and to reduce their cost burden, HRC-X. When applied perpendicular to the migrating plume, HRC-X passively releases the hydrogen required to degrade the mobile contaminant flux. The HRC-X material, once installed, continues to release hydrogen, effectively "cutting off" the migrating plume for a period in excess of 3 years, while avoiding the capital costs associated with engineering, construction and O&M intensive systems.

FIGURE 1
HRC-X INJECTION - for the rapid desorption, dissolution and degradation of residual DNAPL.





HRC Design Software for Plume Area/Grid Treatment

Regenesis Technical Support: USA (949) 366-8000, www.regenesis.com

Site Name:

Location:

Consultant:

Site Conceptual Model/Extent of Plume Requiring Remediation

Width of plume (intersecting gw flow direction)

0 ft	=	
0 ft	=	-
0 ft	=	
0 ft	=	

Length of plume (parallel to gw flow direction)

Depth to contaminated zone

Thickness of contaminated saturated zone

Nominal aquifer soil (gravel, sand, silty sand, silt, clay)

Total porosity

Hydraulic conductivity

Hydraulic gradient

Seepage velocity

Treatment Zone Pore Volume

0 ft	=	
0 ft	=	-
0 ft	=	
0 ft	=	
sand		
0	Eff. porosity:	0
0 ft/day	=	0.0E+00
0 ft/ft	=	
#DIV/0!	ft/yr	=
-	ft ³	=
		#DIV/0!
		-

Dissolved Phase Electron Donor Demand

Tetrachloroethene (PCE)

Contaminant	Stoich. (wt/wt)	
Conc (mg/L)	Mass (lb)	contam/H ₂
0.00	0.0	20.7
0.00	0.0	21.9
0.00	0.0	24.2
0.00	0.0	31.2
0.00	0.0	19.2
0.00	0.0	19.9
0.00	0.0	22.2
0.00	0.0	24.7
0.00	0.0	17.3
0.00	0.0	0.0
0.00	0.0	0.0

Trichloroethene (TCE)

cis-1,2-dichloroethene (DCE)

Vinyl Chloride (VC)

Carbon tetrachloride

Chloroform

1,1,1-Trichloroethane (TCA)

1,1-Dichlorochloroethane (DCA)

Hexavalent Chromium

User added, also add stoichiometric demand

User added, also add stoichiometric demand

Sorbed Phase Electron Donor Demand

Soil bulk density

1.76 g/cm ³	=	110
0.01	range: 0.0001 to 0.01	

Fraction of organic carbon: foc

(Values are estimated using Soil Conc=foc*Koc*Cgw)

(Adjust Koc as nec. to provide realistic estimates)

Tetrachloroethene (PCE)

Koc (L/kg)	Contaminant	Stoich. (wt/wt)
Conc (mg/kg)	Mass (lb)	contam/H ₂
263	0.00	20.7
107	0.00	21.9
80	0.00	24.2
2.5	0.00	31.2
110	0.00	19.2
34	0.00	19.9
183	0.00	22.2
183	0.00	24.7
0	0.00	0.0
0	0.00	0.0

Trichloroethene (TCE)

cis-1,2-dichloroethene (DCE)

Vinyl Chloride (VC)

Carbon tetrachloride

Chloroform

1,1,1-Trichloroethane (TCA)

1,1-Dichlorochloroethane (DCA)

User added, also add stoichiometric demand

User added, also add stoichiometric demand

Competing Electron Acceptors

Oxygen

Electron Acceptor	Stoich. (wt/wt)	
Conc (mg/L)	Mass (lb)	elec acceptor/H ₂
5.00	0	8.0
5.00	0	12.4
5.00	0	27.5
25.00	0	55.9
200.00	0	12.0

Nitrate

Est. Mn reduction demand (potential amt of Mn²⁺ formed)

Est. Fe reduction demand (potential amt of Fe²⁺ formed)

Estimated sulfate reduction demand

Microbial Demand Factor

Safety Factor

3	Recommend 1-4x
2	Recommend 1-4x

3	Recommend 1-4x
2	Recommend 1-4x

Injection Point Spacing and Dose:

Injection spacing within rows (ft)

10.0	# points per row:	0
10.0	# of rows:	0

Injection spacing between rows (ft)

#DIV/0!	Total # of points:	0
---------	--------------------	---

Advectional travel time bet. rows (days)

Minimum req. HRC dose per foot (lb/ft)	#DIV/0!
	7/23/04

Project Summary

Number of HRC delivery points (adjust as nec. for site)	0	
HRC Dose in lb/foot (adjust as nec. for site)	#DIV/0!	#DIV/0!
Corresponding amount of HRC per point (lb)	#DIV/0!	#DIV/0!
Number of 30 lb HRC Buckets per injection point	#DIV/0!	
Total Number of 30 lb Buckets	#DIV/0!	
Total Amt of HRC (lb)	#DIV/0!	#DIV/0!
HRC Cost	#DIV/0!	#DIV/0!
Total Material Cost	#DIV/0!	
Shipping and Tax Estimates in US Dollars		
Sales Tax	rate: 0%	#DIV/0!
Total Matl. Cost		#DIV/0!
Shipping of HRC (call for amount)	\$	-
Total Regenesis Material Cost		#DIV/0!